REMARKS/ARGUMENTS

Claims 1-10 remain pending herein.

Claims 1, 2 and 9 were rejected under 35 U.S.C.§102(b) over JP 10 116 631 A (JP '631).

Claim 1 has been amended as set forth above to recite that the *entire* battery contains *H_2O and HF* in a total concentration of 10,000 ppm or less, *after 20,000 cycles*.

The present inventors found that batteries which have and/or develop (in 20,000 cycles) combined concentrations of H_2O and HF in excess of 10,000 ppm (e.g., a battery having a water concentration of 110 ppm and an HF concentration of 10,120 ppm after 20,000 cycles and under 100 ppm of water after battery production, as in Comparative Example 1) exhibit an undesirably large reduction in discharge capacity, especially after between 15,000 and 20,000 cycles, in comparison with batteries which are otherwise similar but which have a combined concentration of H_2O and HF of below 10,000 ppm even after 20,000 cycles.

The English-language abstract of JP '631 discloses a battery in which the *electrolyte* has a moisture content of from about 1 ppm to about 50 ppm and free acid portion as HF from about 2 ppm to about 100 ppm. As described in the present specification, however, the present inventors found that H_2O and HF contained in regions of the battery other than the electrolyte contribute to the above-mentioned deterioration of discharge capacity. For example, the attached Declaration Under 37 C.F.R. 1.132 describes an experiment in which a battery was constructed as described in JP '631 (including use of a non-acqueous electrolytic solution containing water and HF in concentrations of 10 ppm and 20 ppm, respectively), in which it was observed that after 24 hours, the electrolytic solution contained water in a concentration of 2300 ppm and HF in a concentration of 9700 ppm.

Paragraph [0073] of JP '631 discloses *water content* as a whole battery cell of preferably 2000 ppm or less, as well as water contents for the mixed chemicals of the positive electrode, the mixed chemicals of the negative electrode, or the electrolyte is 500 ppm or less, respectively. Such disclosure does not contain any indication as to the total concentration of H_2O plus HF, or such concentration after 20,000 cycles.

In view of the above, the subject matter of claim 1, amended as set forth above, is not anticipated by JP '631. Similarly, claims 2 and 9, dependent from claim 1, are therefore also not anticipated by JP '631.

Paragraph [0019] of JP '631 appears to disclose that when 0.1 volume percent or more to 7 volume percent or less of a cyclic ether is contained in the electrolyte, controlling the water

content at a level of 0.5 ppm or more to 100 ppm or less and the HF content at a level of 2 ppm or more to 50 ppm or less as a free acid, provides an excellent stabilized effect. Such disclosure appears to be that one may attain a favorable balance in high capacity and stability in cycling. Skilled artisans would not be motivated by such disclosure to attempt to control the water content and the free HF acid when a cyclic ether is being employed in the electrolyte, but not when cyclic ether is not present.

Reconsideration and withdrawal of this rejection are requested.

Claims 3 and 4 were rejected under 35 U.S.C.§103(a) over JP '631 in view of U.S. Patent No. 5,807,646 (Iwata '646).

Iwata '646 is apparently relied on in the Office Action for alleged disclosure of lithium-manganese oxide. Accordingly, the alleged disclosure in Iwata '646 which is relied on in the Office Action fails to overcome the shortcomings of JP '631 as attempted to be applied against claim 1, from which claims 3 and 4 each ultimately depend. Accordingly, reconsideration and withdrawal of this rejection are requested.

Claims 5 and 6 were rejected under 35 U.S.C.§103(a) over JP '631 in view of U.S. Patent No. 5,792,577 (Ejiri '577).

The Office Action appears to rely on Ejiri '577 for alleged disclosure of graphitized carbon fibers. Accordingly, the alleged disclosure in Ejiri '577 relied on in the Office Action would fail to overcome the shortcomings of JP '631 as attempted to be applied against claim 1, from which claims 5 and 6 ultimately depend. Accordingly, reconsideration and withdrawal of this rejection are requested.

Claims 7 and 8 were rejected under 35 U.S.C.§103(a) over JP '631 in view of Iwata '646 and Ejiri '577. Iwata '646 and Ejiri '577 are apparently relied on in the Office Action for the disclosure discussed above. Accordingly, as discussed above, Iwata '646 and Ejiri '577 fail to overcome the shortcomings of JP '631 as attempted to be applied against claim 1, from which claims 7 and 8 each ultimately depend. Accordingly, reconsideration and withdrawal of this rejection are requested.

Claim 10 is rejected under 35 U.S.C.§103(a) over JP '631 in view of U.S. Patent No. 5,709,968 (Shimizu '968) or U.S. Patent No. 6,053,953 (Tomiyama '953).

Shimizu '968 and Tomiyama '953 are apparently relied on for alleged disclosure of use of lithium batteries in electric automobiles. Accordingly, the alleged disclosure relied on in Shimizu '968 and Tomiyama '953 would fail to overcome the shortcomings of JP '631 as

attempted to be applied against claim 1, from which claim 1 depends. Reconsideration and withdrawal of this rejection are requested.

Claim 10 was rejected under 35 U.S.C.§103(a) over U.S. Patent No. 6,053,953 (Tomiyama '953) in view of JP '631.

Tomiyama '953 does not disclose a lithium battery which, after 20,000 cycles, contains water and hydrofluoric acid in a total concentration of 10,000 ppm or less. The Office Action appears to acknowledge this in the first paragraph of page 12 of the April 14, 2003 Office Action, although such paragraph refers to the solution, rather than the battery.

As discussed above, JP '631 also fails to disclose a battery which, after 20,000 cycles, contains water and hydrofluoric acid in a total concentration of 10,000 ppm or less. JP '631 also does not contain any disclosure which would have motivated one of skill in the art to attempt to modify the battery disclosed in Tomiyama '953 in order to arrive at a battery which, after 20,000 cycles, contains water and hydrofluoric acid in a total concentration of 10,000 ppm or less.

Reconsideration and withdrawal of this rejection are requested.

Claims 1-10 were provisionally rejected for obviousness-type double patenting over claims 1-8 and 12 of copending U.S. Patent Application Ser. No. 09/770,725 in view of JP '631, German 198 27 631 (DE '631) or WO 99/33471 (WO '471).

As discussed above, JP '631 fails to disclose or suggest a battery as recited in claim 1, wherein the battery contains water and hydrofluoric acid in a total concentration of 10,000 ppm or less after 20,000 cycles. DE 631, like JP '631, merely discloses concentrations of water and hydrofluoric acid in electrolyte which has not yet been filled into a battery. Accordingly, like JP '631, DE '631 fails to disclose or suggest a battery as recited in claim 1, wherein the battery contains water and hydrofluoric acid in a total concentration of 10,000 ppm or less after 20,000 cycles.

Similarly, WO '471, like JP '631, merely discloses concentrations of water and hydrofluoric acid in electrolyte which has not yet been filled into a battery. Accordingly, like JP '631, WO '471 fails to disclose or suggest a battery as recited in claim 1, wherein the battery contains water and hydrofluoric acid in a total concentration of 10,000 ppm or less after 20,000 cycles.

U.S. Patent Application Ser. No. 09/770,725 is apparently relied on in the Office Action for subject matter other than subject matter relating to the recitation in claim 1 that the battery contains water and hydrofluoric acid in a total concentration of 10,000 ppm or less.

Accordingly, none of the applied references, or any combination thereof, discloses or suggests a lithium secondary battery containing water and hydrofluoric acid in a total concentration of 10,000 ppm or less, as recited in claim 1.

Reconsideration and withdrawal of this rejection are requested.

If the Examiner believes that contact with Applicant's attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicant's attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

August 14, 2003
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